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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,124	08/16/2001	Takahiko Kishi	678-724 (P9876)	3618

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EXAMINER

ZHENG, EVA Y

ART UNIT	PAPER NUMBER
2634	

2634

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 09/931,124	Applicant(s) KISHI, TAKAHIKO	
Examiner Eva Yi Zheng	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 01 March 2005.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-9 and 14-18 is/are rejected.
- 7) Claim(s) 10-13 and 19 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____

DETAILED ACTION

1. Objection to Drawing and Specification has been withdrawn.

Response to Arguments

2. Applicant's arguments filed 3/1/2005 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected.

- a. Applicant's argument – "Each of claims 1 and 5, recite, among other things, that the second IF signal is output as a complexed signal. Shen et al. does not output the second IF signal as a complexed signal."

Examiner's response – Shen et al. disclose a down conversion system in a RF communication receiver, where an RF signal is received at an antenna, pass it through a first mixer to generate an IF signal, a filter reject undesired IF signal, then the filtered signal enters a second mixer to generate a second IF signal, finally the IF signal is demodulated into a baseband signal (Fig. 1 and Col 1, L 24-44). Shen et al. explicitly disclose that the system can use any type of modulation, including AM, FM, phase modulation and quadrature amplitude modulation (Col 10, L8-30). Although it doesn't show in figures, it is well know that when quadrature demodulation is implement in the system by Shen et al, the output of baseband signal generates complex signals. Therefore, Shen et al. meet all the claimed limitations.

Claim Objections

3. Claim 14 is objected to because it is exactly same and a duplication of claim 12.
Appropriate correction is required.
4. Claim 15 is objected to because it is exactly same and a duplication of claim 13.
Appropriate correction is required.
5. Claim 16 is objected to because of the following informalities: on line 8, please change: "the second IF signal" to – a second IF signal--.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claims 16-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 16, line 7, recitation: "processing it" is unclear and confusing of what "it" refers to.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Shen et al. (US 5,640,698).

a) Regarding claim 1, Shen et al. disclose a digital down-converter for converting a frequency of a signal, received at a radio receiver and sampled with a radio frequency (RF) or an intermediate frequency (IF), to a detection frequency for a detection process, comprising:

a first mixer (19 in Fig. 1) for converting and outputting a frequency of the received signal to a frequency of a first IF signal;

a decimation filter (inherent as IF filter 23 in Fig. 1) for suppressing unwanted components among the frequency of the first IF signal from the first mixer (Col 1, L32-34); and

a second mixer (25 in Fig. 1) for converting the frequency of the first IF signal having only wanted components outputted by the decimation filter to a second IF signal of the detection frequency, and outputting the second IF signal as a complexed signal (Col 1, L 34-42; Col 10, L8-30).

b) Regarding claim 5, Shen et al. disclose a receiver comprising:

a digital down-converter including a first mixer (block 19 in Fig. 1) for converting a frequency of the received signal, sampled with a radio frequency (RF) or an intermediate frequency (IF), to a frequency of a first IF signal (Col 1, L 28-31), and a second mixer (block 25 in Fig. 1) for converting the first IF signal converted by the first mixer to a second IF signal of the detection frequency for a detection process and then outputting

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the second IF signal as a complexed signal (inherent as baseband signal; Col 1, L 28-44).

A radio receiver (11 in fig. 1) for receiving an input signal and providing the received signal to the digital down-converter for frequency conversion;

A filter (41 in Fig.2) for attenuating an aliasing frequency component and an image frequency component of the first mixer in the digital down-converter, from an output of the radio receiver; and

An analog-to-digital converter (51 in Fig. 2) for sampling an output of the filter with a radio frequency or an intermediate frequency and providing the sampled signal to the digital down-converter.

10. Claim 1 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Chalmers (US 5,375,146).

a) Regarding claim 1, Chalmers disclose a digital down-converter for converting a frequency of a signal, received at a radio receiver and sampled with a radio frequency (RF) or an intermediate frequency (IF), to a detection frequency for a detection process, comprising:

a first mixer (106 in Fig. 1) for converting and outputting a frequency of the received signal to a frequency of a first IF signal;

a decimation filter (inherent as IF filter 108 in Fig. 1) for suppressing unwanted components among the frequency of the first IF signal from the first mixer; and

a second mixer (112 in Fig. 1) for converting the frequency of the first IF signal having only wanted components outputted by the decimation filter to a second IF signal of the detection frequency, and outputting the second IF signal as a complexed signal (output of 132,134 as shown in Fig. 1).

b) Regarding claim 16, Chalmers discloses a digital down-converter for converting a frequency of a signal, received at a radio receiver and sampled with a radio frequency (RF) or an intermediated frequency (1F), to a detection frequency for a detection process, comprising:

a first mixer (106 in Fig. 1) for converting and outputting a frequency of the received signal to frequency of a first IF signal; and

a second mixer (112 in Fig. 1) for dividing the frequency of the first IF signal into a cosine part and a sine part (output of 132 and 134 in Fig. 1) and processing it with a polyphase structure (220 in Fig. 2) for converting and decoding to the frequency of the second IF signal (150 in Fig. 1).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 2, 6, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shen et al. in view of Ostman (US 6,061,385).

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a) Regarding claims 2 and 6, Shen et al. disclose all of the subject matter described above except for the specific teaching of a frequency of the first IF signal is $\frac{1}{4}$ a sampling frequency.

Ostman, in same field of endeavor, teaches a received frequency modulated signal as shown in Fig. 1, where the intermediated frequency is a quarter of the sampling frequency (Col 4, L28-36).

To avoid complexity and extreme power consumption of the circuitry a well known method is to select the intermediate frequency to be a quarter of the sampling frequency (Ostman, Col 4, L28-35). Therefore, it is obvious to one of ordinary skill in the art to implement quarter sampling method taught by Ostman in the frequency down conversion system by Shen et al. In doing so, reduce power consumption, reduce cost, and simplify communication system design.

b) Regarding claim 7, Shen et al. disclose all of the subject matter described above except for the specific teaching of an automatic gain control (AGC) for amplifying an output of the first mixer.

Ostman, in same field of endeavor, teaches a received frequency modulated signal as shown in Fig. 4, where AGC has to be equipped in a liner receiver (Col 7, L47-56).

A linear arrangement requires more power than other corresponding arrangements, and a linear receiver must al be equipped with AGC in order to provide a sufficient dynamic range (Col 7, L49-52). Therefore, it is obvious to one of ordinary skill in the art to implement a AGC taught by Ostman in the frequency down conversion

system by Shen et al. In doing so, have better frequency control and provide a dynamic range for the linear system.

c) Regarding claim 8, Shen et al. disclose the second mixer is constructed in a polyphase structure comprised of a decimation filter (inherent as anti-aliasing filter in block of Fig. 4, also shown in Fig. 5), and a quadrature converter (though not shown in drawings inherent as baseband signal (Col 1, L 28-44).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 2-4, 9, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chalmers (US 5,375,146) in view of Ostman (US 6,061,385).

a) Regarding claims 2 and 17, Chalmers disclose all of the subject matter described above except for the specific teaching of a frequency of the first IF signal is $\frac{1}{4}$ a sampling frequency.

Ostman, in same field of endeavor, teaches a received frequency modulated signal as shown in Fig. 1, where the intermediated frequency is a quarter of the sampling frequency (Col 4, L28-36).

To avoid complexity and extreme power consumption of the circuitry a well known method is to select the intermediate frequency to be a quarter of the sampling frequency (Ostman, Col 4, L28-35). Therefore, it is obvious to one of ordinary skill in the art to implement quarter sampling method taught by Ostman in the frequency down conversion system by Chalmers. In doing so, reduce power consumption, reduce cost, and simplify communication system design.

b) Regarding claims 3 and 18, Chalmers discloses the digital down-converter as claimed in Claim 17, further comprising an automatic gain control (AGC) amplifier (110 in Fig. 1) for amplifying of the output of the first mixer and inputting the amplified output to the cosine part and the sine part of the second mixer.

c) Regarding claims 4 and 9, Chalmers discloses the digital down-converter, wherein the second mixer further comprises a multiplier for multiplying the output of the decimation filter by a certain ratio of a sampling frequency and a decoding means for decoding the multiplied signal through the multiplier (as shown in Fig. 1).

Allowable Subject Matter

15. Claims 10-13 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

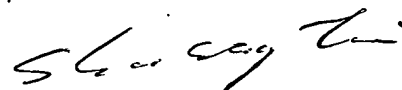
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eva Y Zheng whose telephone number is 571 272-3049. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June 14, 2005

Eva Yi Zheng
Examiner
Art Unit 2634



SHUWANG LIU
PRIMARY EXAMINER